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Qualitative analysis of feedback on Functional Imagery Training: A novel motivational intervention for type 2 diabetes

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## Abstract

**Objective:** Effective motivational support is needed in chronic disease management. This study was undertaken to improve a novel type 2 diabetes motivational intervention, (Functional Imagery Training, FIT) based on participant feedback and results from a self-management randomised controlled trial.

**Design:** Qualitative inductive thematic analysis of semi-structured interviews.

**Main Outcome Measures:** Open-ended questions on participant experiences of the FIT intervention content, process, most/least helpful features, suggestions for improvement and general feedback.

**Results:** Eight themes emerged. Participants thought FIT promoted autonomy and self-awareness. They found the intervention interesting and helpful in keeping their health on track through accountability provided by regular phone calls. However, boredom with repetitive use of imagery, feeling inadequately equipped to manage unhealthy cravings, and difficulty with the time commitment was reported by some. Supplementary written material was recommended.

**Conclusion:** Several well received features of FIT overlapped with those from traditional motivational interviewing. FIT sessions should ensure content is regularly adapted to new health-enhancing goals. After a self-management behaviour becomes habitual, imagery practice could be restricted to challenging contexts. Provision of a written rationale and use of mindfulness for cravings is recommended. With these improvements, the impact of FIT on diabetic control may be substantially enhanced.

**Keywords:** self-management, Elaborated Intrusion Theory, telehealth, thematic analysis, health care

## **Introduction**

Type 2 diabetes is a chronic condition that requires adherence to a complex self-management regimen. In developed countries, around 50% of patients do not adhere to their negotiated health regimens (Sabaté, 2003). Non-adherence impacts the trajectory of patient health (DiMatteo, Haskard, & Williams, 2007), and the high prevalence places a resource and financial burden on the public health system (Jones, Smith, & Llewellyn, 2014). Motivation for adherence can be affected by the anticipated costs/benefits of making a change (Matthews, Arnedt, McCarthy, Cuddihy, & Aloia, 2013), the degree to which the regimen is perceived as interfering with daily life (Kääriäinen, Paukama, & Kyngäs, 2012), and when modifications are not jointly negotiated by practitioner and patient (Matthes & Albus, 2014). Thus, health interventions that are integrated into daily routines, explore and clarify the prospective impact of change, and prioritise patient/practitioner collaboration are likely to enhance motivation and subsequently improve self-management.

Motivational interviewing (MI; Miller & Rollnick, 2002, 2013) embodies these characteristics, and is commonly used in the treatment of maladaptive behaviours. Within this treatment patients consider discrepancies between their values/long-term goals and their lifestyle, and consider the benefits of change. Resistance to modifying behaviour is summarised and reflected back to the patient to promote their autonomy in the decision. Barriers to change are identified to allow promote coping ahead of time and problem-solving. These introspective processes can facilitate goal-directed behaviour through recognition of agency in health-related outcomes and the importance of change (Miller & Rollnick, 2013). There is evidence for the efficacy of MI in addictive behaviours such as smoking (Hettema & Hendricks, 2010) and alcohol dependence (Beckman, 2007). In lifestyle interventions, MI has been used to change diet and exercise, and assist in weight loss in overweight/obese populations (Armstrong et al., 2011; Burke, Arkowitz, & Menchola, 2003). In diabetes self-

management, however, there are mixed findings for both behavioural adjustments and blood glucose control (Chen, Creedy, Lin, & Wollin, 2012; Heinrich, Candel, Shaper, Vries, 2010; Welch, Zagarins, Feinberg, & Garb, 2011). Motivational interventions may be particularly challenging in a diabetes context, given the trajectory of the disease, despite efforts to adhere to a complex regimen. Although health outcomes can improve with MI support, the benefits appear to be limited. Therefore, further refinement of motivational approaches may be needed in diabetes, since motivation is a precursor to health behaviour change.

A new understanding of the determinants of goal-directed behaviour is offered through the Elaborated Intrusion (EI) theory of Desire (Kavanagh, Andrade, & May, 2005). EI theory proposes that goals can be held in working memory as multisensory images. Imagining goal achievement produces a sense of reward or relief. Discrepancies between the anticipated and actual benefits of goal achievement accentuate awareness of any current physiological or emotional deficits that may be relieved by the goal's attainment, building the affective importance and urgency of the goal even further. This process is only halted by the goal attainment or by other cognitive tasks taking and retaining priority in working memory space. Over the past decade since the initial publications about EI Theory, substantial research support has been given to its propositions about the key role of imagery in motivation, and its potential vulnerability to interference from concurrent tasks that require similar working memory capacity (May, Kavanagh & Andrade, 2015).

People who are striving to attain functional goals such as healthy eating are commonly dealing with competing desires (e.g. attractive high-sugar foods). Key goals for interventions are therefore to help people enhance the affective intensity, salience and frequency of mental imagery about the functional goal, and in particular, maintaining and elaborating that imagery in conscious awareness at critical behavioural decision points (e.g. when deciding what to eat). This imagery is expected not only to increase the attractiveness

of the functional goal, but to also interfere with the elaboration of less functional imagery in working memory, which will reduce its power as a temptation. These central tenants of EI theory have informed the development of a novel motivation intervention, Functional Imagery Training (FIT) (Kavanagh, Andrade, May & Connor, 2014; May, Andrade & Kavanagh, 2015).

The first phase of FIT adheres to the currently described principles and practice of motivational interviewing, as outlined above (Miller & Rollnick, 2013; Moyers, Rowell, Manuel, Ernst, & Houck, 2016), but elicits imagery of relevant goals, processes to achieve goals, and anticipated benefits, to accentuate the affective power of the interview. The imagery evoked in FIT involves mental simulation of a health behaviour using all possible senses. For example, a participant wanting to increase exercise could picture themselves walking as vividly as possible, and through doing so anticipate what they would see, hear, smell, taste, and feel on the walk. Once the person expresses commitment to the functional goal, they develop a series of images that express their concrete plans for the coming days. These images are of specific events and evolving situations, capturing preparations, strategies to initiate and maintain the action, successful completion and likely outcomes. Imagery of past successes is used to increase self-efficacy and aid planning for obstacles and barriers. They are asked to make the images as vivid as possible, using multiple senses, and exploring the emotions they experience in response to the anticipated success. They are encouraged to practise this imagery immediately prior to the situation where the action is required, and whenever they undertake a particular routine task (e.g. washing their hands), in order to enhance the availability of the change imagery.

Trials of FIT have already been undertaken on high-caloric snacking (Andrade, Khalil, Dickson, May, & Kavanagh, 2016), and increasing gym attendance (Lennox, Andrade, Kavanagh & May, in submission). Andrade et al. (2016) compared FIT that was

received immediately or after 2 weeks. At 2 weeks, the group that was randomised to receive FIT immediately had a greater reduction in high-calorie food and drink than the delayed group, and in the next 2 weeks, the effect was replicated in the delayed condition. Lennox et al. (in submission) found equivalent effects on increases in gym attendance. In both studies, improvements were associated with an increased frequency of motivational imagery. Changes in behaviour from FIT that are well maintained at 6 months have also been obtained in two uncontrolled pilot trials in people with alcohol misuse (Kavanagh et al., unpublished data).

A recent randomised controlled trial in type 2 diabetes (Parham, Kavanagh, King, Andrade, May, & Gericke, under review) added FIT delivered via telephone to a web-based intervention for diabetic self-management, and compared its effects with the web program alone and a usual care control. In that study, FIT was focused on a self-management goal (diet, physical activity or glucose monitoring) that was selected by the individual participant. Differential changes in motivation cognitions, self-management behaviours and glycemic control were not observed across the sample from the addition of FIT. Greater reductions in HbA<sub>1C</sub> were seen in participants who accessed more pages of the web program, but that was neither the primary focus nor the effect of participation in FIT within this study. Two potential reasons for the limited additional effect of FIT were: (i) a diluted impact of intervention due to variability in individual participants' management needs and personal targets, and (ii) given that greater use of the web program was related to improvements in glycaemic control, effects of FIT might have been more readily seen if it had focused on program use rather than on a specific behavioural goal.

However, there may have been other reasons for the lack of additional benefit from FIT, including negative perceptions of the intervention. Accordingly, the present paper explored participants' experience of FIT through qualitative analysis of semi-structured

interviews, to inform the refinement of FIT for diabetes. Specifically, we wanted to determine if (1) the content of the intervention was clear and meaningful to the participants, (2) use of imagery through an MI approach was helpful for eliciting motivation and behaviour change. Since FIT appears to be effective in health behaviour change, and improved treatment protocols for motivation are needed in diabetes, the current study was needed to enhance this therapeutic approach.

## **Method**

### **Design**

Qualitative analysis was applied to open-ended feedback questions on FIT to understand participant perceptions of treatment strengths and weaknesses, to improve this intervention for future application in diabetes.

### **Participants**

Participants were recruited from the FIT condition of a randomised controlled trial in Australia (Parham et al., under review). For this RCT, eligible participants were diagnosed with type 2 diabetes at least 3 months prior to trial enrolment, had clear command of written/spoken English, regular computer and internet access, and were contactable by phone. Participants were excluded if they had a diagnosis of a psychological disorder (other than depression/anxiety), had significant cognitive impairment, had physical limitations that would prevent ability to increase activity, and were taking oral steroid medication due to its effect on blood glucose. Of the 239 participants who were eligible for randomisation, 73 were allocated to FIT. This study recruited until there was a redundancy of themes, resulting in 37 participants.

### **Procedure**

This study was approved by Uniting Care Health (Cassimatis9111), and the Queensland University of Technology Human Research Ethics Committee (1100000783).



The FIT manual was adapted for diabetes from previous imagery research (Andrade et al., 2016; Kavanagh et al., 2014), and administered via telephone. FIT participants were scheduled to receive 7 phone calls at even intervals over a 3-month period. At conclusion of the final session, participants were invited to provide feedback on the FIT intervention. Those who discontinued the intervention or were lost to follow-up did not provide feedback. Feedback interviews averaged 15 minutes and were in response to five open-ended questions and an opportunity for general comments (Table 6.1).

### **Data Analysis**

Interviews were recorded and transcribed verbatim. Inductive thematic analysis according to the Braun and Clarke (2006) method was applied to identify repeated themes within the feedback. Since the FIT therapist conducted the feedback interviews, an independent researcher conducted a second, independent analysis. Codes were produced from grouped recurring content from all interviews. While the FIT therapist was aware of the intervention's theoretical background, the second assessor was not familiar with either the theory or nature of the intervention, and therefore provided a control against theory-driven analysis. Codes were defined and named separately. The FIT researcher derived a draft set of themes, which were modified in discussion between the assessors. Integrated, consensus results are reported.

## **Results**

### **Sample**

Participants were adult Australians, 55% were male, and the sample had a mean age of 58.31 ( $SD = 10.24$ ). Eight themes emerged from the data.

### **A: Ways in which FIT was useful**

1a. Promotion of autonomy over health

Participants reported freedom to direct the content of sessions, which made the intervention personalised and empowering. Further, they felt the treatment was teaching them skills they could apply independent of the therapy.

*Taking back ownership and not relying on someone else to make the decisions for me was the best thing of the lot. (F08)*

*There's been enough freedom on my side to choose what to focus on (M27)*

*I think making the person talk about it and think for themselves about the specifics that can work. You put the concepts there but then it's starting that person thinking about how the concept can work for them (F20)*

## 2a. Increasing self-awareness of health behaviours

Some found reflection on their lifestyle the most helpful aspect of the intervention. This appeared to highlight unhealthy habits that otherwise would have been ignored. For some, this self-reflection was a confronting process.

*[The most helpful aspect of the intervention was] prompts to start thinking about/highlighting an issue and making them a focus in my weekly or daily life (M18)*

*It's been an interesting eye opener for me about how defensive I was of the way things were and what I was doing and how I didn't really see the need for change, although it hasn't just changed me it's given me a completely different way of looking at something (M12)*

*For me what we were focusing on and talking about were things that I had in my mind but I never brought them forward to act on them (F06)*

## 3a. The intervention helped participants follow through with goals and keep on track

Participants appreciated that there was regular contact with someone who was invested in their health. The follow-up calls seemed to provide motivation to persevere because they would need to disclose their behaviour from the previous fortnight. This assisted participants in prioritising their health goals. A mechanism by which goal follow-through was achieved seemed to be accountability to the therapist and connection with someone.

*The calls are reinforcing because I know you're going to call me and ask, reinforcing that there is an issue that needs to be addressed. It's quite easy to live your life and realise there's a problem but not do anything about it. But knowing that you will ask me how this is going makes me stay on track (M02)*

*One of the good things about the calls is it keeps you mentally focused. One of the things that can happen is lack of follow up, and you can roll along for a certain period of time and then all of a sudden you get a nasty shock. And that's where I think talking to someone independent gives you that feedback which is a good thing (M27)*

*Some people can do it on their own but some people actually need someone to report back to, so I think that's been great (F04)*

*It helped me to give a priority to doing the imagery because I knew that I would need to report back on how I was going, so you know that's always good to have a reason to be doing something first up when it's new and different (F10)*

#### 4a. The intervention was interesting and helpful

All participants reported that engagement in this treatment was worthwhile. A recurring strength of the intervention was its non-judgemental approach, especially when patients lapsed during the week. Overall the intervention was perceived as gentle, supportive and understanding, as well as giving encouragement to persevere.

*I think the calls were very good, informative and helpful (F07)*

*It's not aggressive, it's not assertive, it's gentle prodding (F01)*

*People need to be aware that at times we do fail, and I think you've been very positive in approaching, in your manner, it's good to have that (M21)*

*I think the visualising and me being able to see that you're guiding me, not judging or berating, it was just a guidance. Yep we all have days that we fall down, but let's see if we can work on this again (F13)*

## **B. Ways in which FIT could be improved**

### **5b. Time Commitment**

Some reported that the frequency of calls was somewhat disruptive and difficult to integrate into their schedules.

*Sometimes it was a bit difficult fitting the calls in (M22)*

*Fitting it in around my schedule was a bit difficult (F15)*

### **6b. Acceptability and utility of imagery varied with time and age**

The process of learning the intervention was reportedly simple and some found it easy to integrate into their lives. Participants generally felt that the imagery was helpful but the duration of its utility was unclear. Because the techniques were regularly practised, some reported boredom with the strategies. One older participant reported that content was vague, and that the intervention was therefore undesirable.

*[To] see in your mind's eye the end result of something, rather than just thinking this is going to take ages or I don't think I can really lose this much belly fat. If you can actually see it in your mind that it's already done, it seems to make the process easier*

*and automatic. You sort of automatically do things that are for your own benefit*  
(F26)

*The guided imagery when you first told me about it was really good...but after a little while it got a bit tedious. It was positive at first; it ruled me on to continue to do good stuff about my health. Not that it's not doing it now, I'm still doing well but...doing it daily became tedious* (F28)

*It probably was a bit way out for me. If you like, too different. I'm at the stage of life where reality is far more influential than anything else* (M09)

#### 7b. Difficulty with unhealthy imagery and overcoming physiological drives

Initiating healthy imagery was more successful than inhibiting imagery. Some participants who used distraction techniques to reduce desire for unhealthy behaviours reported difficulty. In some instances the imagery practice led to heightened attention on unhealthy content. This paired with hunger made it difficult to achieve dietary goals for some.

*The problem was I suppose...I have very strong mental imagery, but it tends to associate with the wrong things. I think about something that I want to have to eat, whereas I needed... [to think of] the benefit of not having anything. And that's where the interruption probably worked with me, because it broke the train of thought, and I think that was probably something that was hard for me* (M17)

*[The imagery is] doable and it works, but sometimes it doesn't work. It's all well and good to think about yourself as being a 90kg weakling, but at the time if you're hungry, well it tends to be pushed to one side for food* (M22)

*The problem is that you can try to put one [image] forward but there is a counter image. Try to imagine fruit and the benefit of it or whatever but then the enjoyment of a nice*

*biscuit, a negative one can appear which can seem more appealing. And when that happens with feelings of hunger, that [unhealthy] image can be reinforced (M14)*

#### 8b. Need for written material

A number of participants suggested that a summary email with what was covered after each session would have helped them remember the content and the homework better. Written documentation with more prescriptive homework was asked for.

*[To get more out of sessions] when we started, probably some written material. One of the things you might consider is providing some outline material and let people read through... as an introduction (M02)*

*I think I'm a person that likes to read things, so having that visual reminder a couple of days later would probably help cement that knowledge for me (M11)*

### Discussion

The themes that emerged from this feedback indicate that with further revision, Functional Imagery Training will be an acceptable approach to motivational support in type 2 diabetes. Overall, FIT participants appear to have appreciated the promotion of autonomy, its gentle therapeutic approach, the development of greater self-awareness, and the accountability provided through follow-up phone calls. However, these features are ones that are shared with a motivational interviewing approach (i.e. promotion of autonomy, gentle therapeutic approach, greater self-awareness; Miller & Rollnick, 2002, 2013) and with the provision of any therapist follow-up (accountability), rather than being specific to FIT. Issues with FIT included difficulty with competing imagery, lack of clarity from no supplementary written material, boredom with overuse of imagery and difficulty with time commitment to the intervention.

### **Theme 1a. Autonomy**

Patient autonomy is associated with effective self-management (Williams, McGregor, Zeldman, Freedman, & Deci, 2004). Conversely, when autonomous support is not provided, for example through prescribed diets and activity plans, patients can lose motivation (Bhattacharya, 2012). FIT emphasises a collaborative approach to treatment, and that emphasis was recognised and appreciated by participants in the current study. Its autonomy support included acknowledging patient perspectives, offering choices in the management process, providing targeted information and minimising pressure.

### **Theme 2a. Self-awareness**

The process of using FIT appeared to enhance participant's self-awareness. This is likely because the intervention guided self-reflection in every session and enabled confrontation with unhelpful habits. Increasing self-awareness contributes to helpful rumination on a patient's agency in their own health (Jutterström, Isaksson, Sandström, and Hörnsten, 2012). It is therefore likely an important mechanism in motivation. A non-judgmental approach, particularly to problems with adherence and goal attainment, was also strongly valued by the participants. Their report of this characteristic of the intervention suggests that their experience was consistent with the 'spirit of motivational interviewing' (Miller & Rollnick, 2002, 2013), and with the formation of a collaborative approach to treatment (Matthes & Albus, 2014).

### **Theme 3a. Staying on track and Theme 5b. Time commitment**

Participants reported greater likelihood of following through with goals due to the regular telephone contact. This is consistent with the literature on health maintenance and social support. Significant changes to health behaviour are notoriously difficult to sustain (Ofstedal, Karlsen, & Bru, 2010). While the accountability in the intervention was a strength, if adherence were attributed to this external accountability, intrinsic motivation may be

undermined, and withdrawal of therapist support at the end of the treatment would induce significant vulnerability (Deci & Ryan, 2008). FIT emphasises intrinsic motivation, however the high valuation of accountability may present a potential weakness. In addition, frequency of calls was perceived as problematic by some. Less dependence on the therapist and fewer sessions may therefore improve efficacy and desirability of the intervention.

#### **Theme 4a. Interesting/Helpful intervention and 6b. Limits of imagery**

Most participants found the intervention imagery relatively easy to learn and incorporate into their usual routines. This ease of use may assist with the uptake of the intervention if it were delivered widely, as simple regimens seem to elicit better adherence (Safren et al., 2014), and routines that are integrated with usual daily structures are more likely to be completed (Kääriäinen et al., 2012). However, highly engaged participants also reported gradual boredom with the imagery tasks due to the repetitive nature of their cognitions. The FIT protocol recommends that participants regularly refresh their imagery, by focusing on new events, which incorporate their experiences of positive outcomes and effective control strategies. Once a behaviour is becoming established, participants are also encouraged to consider new goals that support their original ones, but have a changed focus (e.g. if the original goal was physical exercise, they may now focus on ensuring their dog has a walk, or on improving their tennis game). The evolution of goals is increasingly becoming an essential feature of FIT, and these reports by participants suggest that it may not have been sufficiently fostered in the current study.

Some other modifications to FIT may further assist with this issue. Frequent daily practice is now typically focused on the first 2 weeks, in order to establish the habitual use of imagery. Subsequently, imagery is primarily used before situations where control is needed. Over time, behaviours related to a particular goal would hopefully become embedded in routine sequences that require less constant deliberate and effortful control. This would mean



functional imagery was then only required for occasions when that control is under threat, the person faces an infrequent or novel situation or they want to establish behaviours related to a new goal.

### **Theme 7b. Overcoming unhealthy imagery and physiological drives**

While FIT focuses on increases in functional imagery, that imagery is also expected to compete for working memory resources with dysfunctional craving imagery, and assist with moderating the latter's intensity. However, some participants reported difficulty with particularly challenging situations, where they experienced vivid dysfunctional imagery and strong craving, despite attempting to use the functional imagery. Competing working memory tasks, including imagery that is unrelated to the temptation, have been reliably shown to reduce the vividness and affective intensity of craving imagery (Andrade, May, & Kavanagh, 2012). 'Break-through' intrusions of craving images are still expected to occur, especially if the craved target is physically present and a relevant physiological deficit is in awareness (e.g. if they are hungry and a chocolate cake is in front of them). Furthermore, rehearsal of functional imagery may sometimes trigger craving imagery, when the content is similar (e.g. sharing a focus on eating). Future research could perhaps apply meditation to assist users to accept and disengage from the craving images, if they are intruding into consciousness and causing discomfort or undermining self-efficacy, since meditation is known to moderate craving (Hamilton, Fawson, May, Andrade, & Kavanagh, 2013).

### **Theme 8b. Written material**

Functional imagery training was delivered via telephone in the current study. While our pilot studies on alcohol misuse have not found any difference in effects when all sessions were by telephone, the absence of any face-to-face sessions may have been an issue in this sample. While the imagery strategies were reportedly easy to acquire, there was a large volume of content covered, there were often 2 weeks between sessions, and a minority of

participants appeared to struggle to comprehend the overall rationale for the intervention. These problems may have been exacerbated by the age and physical status of the participants, some of whom may have had difficulty with comprehension or recall of the session content. As some respondents suggested, supplementary written material may have increased the impact of the FIT sessions. Since FIT was delivered in conjunction with a web-based intervention, this information could have been integrated into a section of the site for convenience. In a current alcohol trial on FIT, participants are asked to make written summaries during the telephone sessions using worksheets, and a phone application gives a brief rationale and instructions on imagery for review between sessions. These tools may also be needed in FIT for diabetes and should be trialled in future research.

### **Limitations**

A limitation of this study was that feedback was only provided by participants who completed all FIT sessions. Valuable insights may have been gained from those who discontinued the intervention, who may well have been more critical. Furthermore, the therapist who conducted the intervention obtained the participant feedback. Responses may therefore have been biased to reflect a positive experience in the trial, although this therapeutic alliance may also have allowed participants to be more open in reporting both strengths and weaknesses. Since a number of limitations were outlined by the patients, it seems that they were comfortable in disclosing negative reactions.

### **Conclusion**

While functional imagery training was well received by participants, it did not successfully enhance motivation for a healthy lifestyle or initiate behaviour change in this sample (Parham et al., under review). The intervention appears to have effectively maintained elements of motivational interviewing such as autonomy support and sensitivity around failure, which was appreciated by participants. Improvements to the FIT protocol in type 2

diabetes may include providing supplementary written material, and ensuring that ongoing imagery practice is more varied and targeted to situations where it is most needed. If intrusive craving cognitions continue to be a major issue, despite appropriate use of the functional imagery, an increased emphasis on mindfulness may be needed, or alternative competing working memory tasks provided. Since use of other resources, such as our web program (OnTrack Diabetes) appear critical to enhanced glycaemic control, FIT could be targeted to use of the program rather than specific management behaviours. Following these adjustments, FIT may show a greater impact on diabetic outcomes.

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There are no conflicts of interest declared.

## References

- Andrade, J., May, J., & Kavanagh, D. J. (2012). Sensory imagery in craving – From cognitive psychology to new treatments for addiction. *Journal of Experimental Psychopathology*, 3(2), 127-145. doi:10.5127/jep.024611
- Andrade, J., Khalil, M., Dickson, J., May, J., & Kavanagh, D. J. (2016). Functional imagery training to reduce snacking: Testing a novel intervention for weight management based on Elaborated intrusion theory. *Appetite*, 100, 256-262. doi:10.1016/j.appet.2016.02.015
- Armstrong, M. J., Mottershead, T. A., Ronksley, P. E., Sigal, R. J., Campbell, T. S., & Hemmelgarn, B. R. (2011). Motivational interviewing to improve weight loss in overweight and/or obese patients: A systematic review and meta-analysis of randomised controlled trials. *Obesity Reviews*, 12(9), 709-723. doi:10.1111/j.1467-789X.2011.00892.x
- Bartol, T. (2012). Improving the treatment experience for patients with type 2 diabetes: Role of the nurse practitioner. *Journal of the American Academy of Nurse Practitioners*, 24, 270–276. doi:10.1111/j.1745-7599.2012.00722.x
- Bhattacharya, G. (2012). Psychosocial impacts of type 2 diabetes self-management in a rural African-American population. *Journal of Immigrant Minority Health*, 14, 1071–1081. doi:10.1007/s10903-012-9585-7
- Beckman, N. (2007). Motivational interviewing with hazardous drinkers. *Journal of the American Academy of Nurse Practitioners*, 19(2), 103-110.
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.

- Burke, B. L., Arkowitz, H., & Menchola, M. (2003). The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. *Journal of Consulting Clinical Psychology, 71*(5), 843-861.
- Chen, S. M., Creedy, D., Lin, H-S., & Wollin, J. (2011). Effects of motivational interviewing intervention on self-management, psychological and glycaemic outcomes in type 2 diabetes: A randomized controlled trial. *International Journal of Nursing Studies, 49*, 637-644. doi:10.1016/j.ijnurstu.2011.11.011
- Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology, 49*(1), 14-23.
- DiMatteo, M. R., Haskard, K. B., & Williams, S. L. (2007). Health beliefs, disease severity, and patient adherence: A meta-analysis. *Medical Care, 45*, 521-528.  
doi:10.1097/MLR.0b013e318032937e
- Egede, L. E., & Osborn, C. Y. (2010). Role of motivation in the relationship between depression, self-care, and glycaemic control in adults with type 2 diabetes. *The Diabetes Educator, 36*, 276-283. doi:10.1177/0145721710361389
- Fox, C., & Kilvert, A. (2003). Intensive education for lifestyle change in diabetes: Ongoing input is required to effect and maintain change in behavior. *British Medical Journal, 327*, 1120-1121. Retrieved from: <http://www.jstor.org/stable/25457754>
- Hamilton, J., Fawson, S., May, J., Andrade, J., & Kavanagh, D. J. (2013). Brief guided imagery and body scanning interventions reduce food cravings. *Appetite, 71*, 158-162.
- Heinrich, E., Candel, M. J., Shaper, N. C., & Vries, N. K. (2010). Effect evaluation of a motivational interviewing based counselling strategy in diabetes care. *Diabetes Research and Clinical Practice, 90*(3), 270-278. doi:10.1016/j.diabres.2010.09.012.
- Hettema, J. E., & Hendricks, P. S. (2010). Motivational interviewing for smoking cessation: A meta-analytic review. *Journal of Consulting Clinical Psychology, 78*(6), 868-884.

- Jones, C. J., Smith, H., & Llewellyn, C. (2014). Evaluating the effectiveness of health belief model interventions in improving adherence: A systematic review. *Health Psychology Review*, 8, 253-269. doi:10.1080/17437199.2013.802623
- Jutterström, L., Isaksson, U., Sandström, H., & Hörnsten, A. (2012). Turning points in self-management of type 2 diabetes. *European Diabetes Nursing*, 9, 46-50.
- Kääriäinen, M., Paukama, M., & Kyngäs, H. (2012). Adherence with health regimens of patients on warfarin therapy. *Journal of Clinical Nursing*, 22, 89–96. doi:10.1111/j.1365-2702.2012.04079.x
- Kavanagh, D. J., Andrade, J., & May, J. (2005). Imaginary relish and exquisite torture: The elaborated intrusion theory of desire. *Psychological Review*, 112, 446-467. doi:10.1037/0033-295X.112.2.446
- Kavanagh, D. J., Andrade, J., May, J., & Connor, J. (2014). Motivational interventions may have greater sustained impact if they trained imagery-based self-management. *Addiction*, 109(7), 1062-1063.
- Lennox, E., Andrade, J., Kavanagh, D. J., & May, J. (2016) *Do you come here often? Using motivational imagery to increase physical activity*. Manuscript submitted for publication
- Matthes, J., & Albus, C. (2014). Improving adherence with medication a selective literature review based on the example of hypertension treatment. *Deutsches Ärzteblatt International*, 111, 41-47. doi:10.3238/arztebl.2014.0041
- Matthews, E. E., Arnedt, J. T., McCarthy, M. S., Cuddihy, L. J., & Aloia, M. S. (2013). Adherence to cognitive behavioural therapy for insomnia: A systematic review. *Sleep Medicine Reviews*, 17, 453-464. doi:10.1016/j.smrv.2013.01.001

- May, J., Andrade, J., & Kavanagh, D. J. (2015). An imagey-based road map to tackle maladaptive motivation in clinical disorders. *Frontiers in Psychology*, 6, 14. doi:10.1111/add.12472
- May, J., Kavanagh, D. J., & Andrade, J. (2015). The elaborated intrusion theory of desire: A 10-year retrospective and implications for addiction treatments. *Addictive Behaviours*, 44, 29-34. doi:10.1016/j.addbeh.2014.09.016.
- Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change*. London: The Guilford Press.
- Miller, W. R., & Rollnick, S. (2013). *Motivational interviewing: Helping people change* (3<sup>rd</sup> Ed). London: The Guilford Press.
- Moyers, T. B., Rowell, L. N., Manuel, J. K., Ernst, D. & Houck, J. M. (2016). The motivational interviewing treatment integrity code (MITI 4): Rationale, Preliminary, Reliability and Validity. *Journal of Substance Abuse Treatment*, 65, 36-42. doi:10.1016/j.sat.2016.01.001.
- Oftedal, B., Karlsen, B., & Bru, E. (2010). Perceived support from healthcare practitioners among adults with type 2 diabetes. *Journal of Advanced Nursing*, 66(7), 1500–1509. doi: 10.1111/j.1365-2648.2010.05329.x
- Ong, W. M., Chua, S. S., & Ng, C. J. (2014). Barriers and facilitators to self-monitoring of blood glucose in people with type 2 diabetes using insulin: a qualitative study. *Patient Preference and Adherence*, 8, 237–246. doi:10.2147/PPA.S57567
- Parham, S. C., Kavanagh, D. J., King, N., Andrade, J., May, J., & Gericke, C. A. (under review). *Effects of a Diabetes Web-Based Program and Functional Imagery Training: A Randomised Controlled Trial*. Manuscript submitted for publication
- Sabaté, E. (2003). *Adherence to long-term therapies: Evidence for action*. Geneva: World Health Organisation.

Safren, S. A., Biello, K. B., Smeaton, L., Mimiaga, M. J., Walawander, A., Lama, J.

R...Campbell, T. B. (2014). Psychosocial predictors of non-adherence and treatment failure in a large scale multi-national trial of antiretroviral therapy for HIV: Data from the ACTG A5175/PEARLS trial. *PLoS ONE*, 9, 1-10.

doi:10.1371/journal.pone.0104178

Welch, G., Zagarins, S. E., Feinberg, R. G., & Garb, J. L. (2011). Motivational interviewing delivered by diabetes educators: Does it improve blood glucose control among poorly controlled type 2 diabetes patients? *Diabetes Research and Clinical Practice*, 91(1), 54-60.

Williams, G. C., McGregor, H. A., Zeldman, A., Freedman, Z. R., & Deci, E. L. (2004).

Testing a self-determination theory process model for promoting glycaemic control through diabetes self-management. *Health Psychology*, 23, 58-66. doi:10.1037/0278-

6133.23.1.58